

## ABSTRACT OF THE DISCLOSURE

A microscale biosensor for use in the detection of target biological substances includes a detection chamber disposed on the substrate and defining a volume between 1 pico-liter and 1 micro-liter. The detection chamber is adapted to confine a composition containing microorganisms. Specimen concentration componentry is connected to the detection chamber 5 for rapidly concentrating the microorganisms in the detection chamber. A heater is operatively connected to the substrate to heat the composition in the detection chamber. Electrodes are mounted on the substrate in communication with the detection chamber to identify AC impedance changes within the detection chamber from bacterial metabolism of the microorganisms of the composition over time.

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